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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,317	09/29/2003	Robert Francis Bartfai	TUC920030119US1	5277
46917	7590	11/02/2005	EXAMINER	
KONRAD RAYNES & VICTOR, LLP. ATTN: IBM37 315 SOUTH BEVERLY DRIVE, SUITE 210 BEVERLY HILLS, CA 90212			KRAVETS, LEONID	
			ART UNIT	PAPER NUMBER
			2189	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/675,317

Applicant(s)

BARTFAI ET AL.

Examiner

Leonid Kravets

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/12/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## ***DETAILED ACTION***

### ***Information Disclosure Statement***

1. Acknowledgment is made of the information disclosure statement received 4/12/2004.

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The applicant's abstract exceeds 150 words and contains two paragraphs. It is not necessary to say "Disclosed is a..." and "Also disclosed is a..." Please rewrite the abstract according to the above guidelines

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6-7, 16-17, 26-27 recite the limitation "image in the cache". There is unclear antecedent basis for this limitation in the claim. Which cache in the system is being referred to?

6. Claims 8, 18, 28 recite the limitation "updating the indicator". There is unclear antecedent basis for this limitation in the claim. It is unclear whether the first structure or second structure is being referred to.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-5, 7-15, 17-25 and 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Symmetrix Remote Data Facility.

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9. As per claim 1, Symmetrix discloses a method for maintaining consistency of data (Page 24, Synchronous mode), comprising:

copying one or more blocks of data identified by a first structure to form a consistent set of data [Mirroring data between source and target, accurate up to the last transaction (Page 24, Synchronous mode)]; and

while not acknowledging completion of write requests to any blocks of data [acknowledgement does not occur until after the second structure is created (Page 25, Step 3)], creating a second structure (Data within RLA), wherein the second structure indicates which blocks of data are modified while the consistent set of data is being formed [Modified data is stored in the remote Symmetrix cache, signifying modified blocks of data, since the consistent set is not complete until the data is written, this occurs while the consistent set is being formed].

10. As per claim 2, Symmetrix discloses the method of claim 1, further comprising:  
after creating the second structure,

allowing completion of write requests that had not been acknowledged [sending complete signal back to the host/server initiating the I/O request (Page 25, Step 4)]; and

processing new write requests, with modifications to blocks of data being recorded using the second structure [The next write update would be recorded using the second structure].

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11. As per claim 3, Symmetrix discloses the method of claim 2, wherein the second structure includes indicators, and wherein each indicator indicates whether a corresponding block of data was modified while the consistent set of data is being formed [SRDF keeps track tables describing whether the track image is synchronized with its external pair; allowing mirroring of only those tracks that have changed since the last update (Page 32, 2<sup>nd</sup> Paragraph). Note that since Symmetrix supports source/target switching, both sites must have track tables (Page 28)], further comprising:

receiving a new write request for a block of data (Page 24, Step 2); and

if modifications to blocks of data are being recorded using the second structure and an indicator corresponding to the block of data is set in the first structure to indicate that the block of data is to be copied (Page 28, Sequential Data Updates Across the Link),

sending an image of the block of data in cache to remote storage (Page 28, Sequential Data Updates Across the Link);

setting the corresponding indicator in the first structure to indicate that the block is not to be copied [Symmetrix places blocks to be copied into a FIFO, thus once a block is transferred it will not be copied again (Page 28, Sequential Data Updates Across the Link)]; and

processing the new write request [SRDF writes data to remote Symmetrix storage, thus it must process the write request (Page 28, Sequential Data Updates Across the Link)].

12. As per claim 4, Symmetrix discloses the method of claim 2, wherein the second structure includes indicators, and wherein each indicator indicates whether a corresponding block of data was modified while the consistent set of data is being formed [SRDF keeps track tables describing whether the track image is synchronized with its external pair; allowing mirroring of only those tracks that have changed since the last update (Page 32, 2<sup>nd</sup> Paragraph). Note that since Symmetrix supports source/target switching, both sites must have track tables (Page 28)] further comprising:

receiving a new write request for a block of data (Page 24, Step 2); and  
if modifications to blocks of data are being recorded using the second structure, an indicator corresponding to the block of data is set in the first structure to indicate that the block of data is to be copied (Page 32, 2<sup>nd</sup> Paragraph), and the block of data has a new image in cache, applying the new write request to the new image [In the Symmetrix system, as in any backup system, a consistency set requires the most up to date data; therefore the write request would be applied to the newest available image].

13. As per claim 5, Symmetrix discloses the method of claim 4, further comprising:

if at least one of modifications to blocks of data are not being recorded using the second structure and the indicator corresponding to the block of data is not set in the first structure to indicate that the block of data is to be copied, processing the new write request normally [SRDF provides for selection of data to be remotely mirrored, thus the write requests for data not mirrored would be processed normally (Page 20, Installation and Planning)].

14. As per claim 7, Symmetrix discloses the method of claim 4, further comprising:  
sending an image of a block of data in cache to remote storage; and  
if modifications to blocks of data are being recorded using the second structure  
and the block of data has an image in the cache,  
discarding the image in the cache (Page 32, 1<sup>st</sup> Paragraph)  
setting the corresponding indicator in the first structure to indicate that the  
block is not to be copied [Track table keeps track of tracks that have changed and need  
to be copied, thus the structure would set the indicator to not copy the block (Page 32,  
2<sup>nd</sup> Paragraph)].

15. As per claim 8, Symmetrix discloses a method for asynchronous copy,  
comprising:  
updating indicators in a first structure for one or more blocks of data, wherein  
each indicator in the first structure indicates whether a corresponding block of data was  
modified since the block of data was last sent to remote storage (Page 32, 2<sup>nd</sup>  
Paragraph); and  
while copying the blocks of data identified by the indicators in the first structure  
as having been modified since the blocks of data were last sent to remote storage,  
updating indicators in a second structure for the one or more blocks of data, wherein  
each indicator in the second structure indicates whether a corresponding block of data  
was modified while a consistent set of data is being formed [Modified data is stored in



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the remote Symmetrix cache, signifying modified blocks of data, since the consistent set is not complete until the data is written, this occurs while the consistent set is being formed].

16. As per claim 9, Symmetrix discloses the method of claim 8, further comprising:

after copying a block of data identified by an indicator in the first structure to the remote storage, updating the indicator to indicate that the block of data is synchronized with the remote storage (Page 31, Use of Track Tables, 4<sup>th</sup> Bullet).

17. As per claim 10, Symmetrix discloses the method of claim 8, further comprising:

after receiving a run command [RESUME command of Symmetrix is equivalent to the RUN command (Page 31, 5<sup>th</sup> Bullet)],

resuming acceptance of write requests from a host (Page 31, 5<sup>th</sup> Bullet);

updating indicators in the second structure instead of in the first structure [Indicators in second Track Table would have to be updated to synchronize the structures]; and

copying the blocks of data identified by the indicators in the first structure as having been modified since the blocks of data were last sent to remote storage (Page 31, 5<sup>th</sup> Bullet).

As per claims 11-15, 17-25 and 27-30 please see rejections of 1-5 and 7-10 above.

These claims are rejected for similar reasons.

***Claim Rejections - 35 USC § 103***

18. Claims 6, 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Symmetrix as applied to claim 4 above, and further in view of Handy.

19. As per claim 6, Symmetrix discloses the method of claim 4, further comprising:  
if modifications to blocks of data are being recorded using the second structure, an indicator corresponding to the block of data is set in the first structure to indicate that the block of data is to be copied, and the block of data does not have a new image in cache [Track table stores indicator indicating block of data is to be copied and whether image is in cache (Page 31, Use of Track Tables)],

Symmetrix does not disclose:

allocating a new image for the block of data; and  
applying the new write request to the new image.

Handy discloses

allocating a new image for the block of data (Page 72, 4<sup>th</sup> Paragraph);  
and  
applying the new write request to the new image (Page 72, 4<sup>th</sup> Paragraph).

As per claims 16 and 26 please see rejection of claim 6 above. These claims are rejected for similar reasons

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the allocation of new images of Handy into the system of Symmetrix, since Symmetrix and Handy form the same field of endeavor, namely data transfer and this would allow for proper caching of data.

### ***Conclusion***

20. The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.


21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


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22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Kravets whose telephone number is 571-272-2706. The examiner can normally be reached on M-F, 8-4:30.

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached at 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Leonid Kravets  
Patent Examiner  
Art Unit 2189

  
BEHZAD JAMES PEIKARI  
PRIMARY EXAMINER

October 20, 2005